REMARKS

In the Office Action, the Examiner noted that claims 6 – 18 are pending in the application, and claims 6 – 18 are rejected. The Examiner's rejections are traversed below.

The Examiner summarized the Applicant's argument in its previous response and stated that Adelson clearly teaches defining a plurality of image regions based on the spatial frequency bands where apparently each of the plurality of image regions corresponds to a location on the object when images of the object are taken. The Applicant respectfully disagrees, and re-asserts its argument to traverse the rejections.

Adelson derives pixel sample sets by separately filtering each of the M differently focused images. Each of the M differently focused images are filtered with each of N different band-pass filters – and the sets of pixels having the highest absolute value level are derived as the pixel sample set for each of the N x M images. The pixel sample sets, therefore, are not defined regions corresponding to a location on the object – but instead they are merely computed regions in an image that have no association with the object whatsoever.

Applicant's recited step of defining a plurality of image regions corresponding to a location on the object is an important distinction, and one that ultimately results in an accurate computation of a composite image, since the spatial information of the image regions is known.

REJECTION UNDER 35 U.S.C. § 103(a)

Claims 6 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 4,661,986 to Adelson (hereinafter, "Adelson") and further in view of U.S. Patent 6,831,694 to Ohki (hereinafter, "Ohki").

Regarding claim 6, the Applicant claims a method for generating a focused image of an object that includes the step of defining a plurality of image regions, each of the plurality of image regions corresponding to a location on the object. This essential step of the method claimed by the Applicant is not taught or suggested by either Adelson or Ohki. Adelson teaches a pixel-by-pixel based method to select the best-focused pixel

from a plurality of images for each pixel in the generated image by locating pixel sample sets that are not associated with image regions, while Ohki teaches a method of selecting the best-focused image from a plurality of differently-focused images.

Adelson discloses a computationally intensive method for implementing an analysis of the two-dimensional spatial frequencies of each of a plurality of differently-focused images to generate a single "improved-focus" image. In his disclosure, Adelson teaches an analysis of the spatial frequency spectrum of each one of separate images (i.e., the differently-focused images M). See Adelson, column 4, lines 4-56, and column 5, lines 25-40. The spatial frequency spectrum analysis examines the entire image (each of the M images) by sampling the image with a decreasing pixel density for each descending frequency band N. The frequency spectrum analysis is performed on *the entire image* – not using defined image regions as claimed by the Applicant. Further, the pixels that are sampled at each of the N frequency bands between each of the M images is dictated by the spatial frequencies that are exhibited in each of the M images, and thus, different between the images. By contrast, the method claimed by the Applicant operates on each separately focused image identically – i.e., by measuring a sharpness score for each image region, each image region being defined and corresponding to a location on the object.

In other words, the pixel sample sets that Adelson derives result from an analysis of the image, while in the Applicant's claimed method, the image regions correspond to a location on the object. The Applicant claims the specific limitation of defining a plurality of image regions that correspond to a location on the object. The pixel sample sets from Adelson are not defined image regions – in fact, there is no definition of the location of pixel sample sets. The pixel sample sets that are derived from an analysis of the N frequency analyses, as disclosed by Adelson, have no association with the object whatsoever.

Further, Ohki teaches a method that fails to teach or suggest the step of defining image regions corresponding to a location on the object as claimed by the Applicant. Ohki discloses a method for computing a composite image by combining a plurality of images using a weighted average using a sharpness score, where the sharpness is

measured *over the entire image*. While Adelson teaches the computationally expensive method of selecting pixels for a composite focused image using a spectrum analysis of each of differently focused images, Ohki teaches to use a weighted average of all the pixels of each image. By contrast, the Applicant's method claims a step of defining image regions that are used to compute the composite focused image.

The MPEP states that all the claim limitations must be taught or suggested by the prior art to establish prima facie obviousness of a claimed invention. Since the cited references, alone or in combination, fail to teach or suggest a step of defining image regions corresponding to a location on the object, as claimed by the Applicant, claim 6 cannot be rendered obvious to one skilled in the art.

Regarding claim 17, which depends from claim 6, analogous argument applies with equal force. Additionally, since the claim depends from claim 6, that the Applicant argues is allowable, claim 17 is also allowable.

Claims 6, 7, 12 – 14 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Adelson and further in view of U.S. Patent 5,647,025 to Frost (hereinafter, "Frost").

Regarding claim 6, as argued above, Adelson does not teach or suggest the step of defining a plurality of image regions, each of the plurality of image regions corresponding to a location on the object, as claimed by the Applicant. Instead, Adelson teaches that the entire image of each differently-focused image is analyzed to generate a single-focus composite image. By contrast, the Applicant claims measuring a sharpness score for each of the defined image regions, and computes a composite image by combining each of the plurality of images using a determined spatial weighting for the image regions using the sharpness score.

The deficiencies in the teachings of Adelson that fail to support a basis of rejection for obviousness are not remedied through the combination of Frost. Frost teaches that a focus score, along with an associated focus position (i.e., the location on the object) can be used to generate a model of the focused surface of the object. Frost merely teaches that a model of the object surface – analogous to a roadmap – can be determined so that a subsequent inspection can be readily performed by consulting the

model. There is nothing to teach or suggest a step of defining image regions corresponding to a location on the object – upon which sharpness scores are measured to determine a spatial weighting, and used to compute a composite image by combining the image regions using the spatial weighting.

Accordingly, the Adelson and Frost references, combined, or each individually, do not teach or suggest the computation of a composite image that is derived from combining defined image regions of a plurality of images using a spatial weighting determined from each of the image regions using a measured sharpness score, as claimed by the Applicant.

Regarding claim 7, and 12 – 14, that depend from claim 6, analogous argument applies with equal force. Additionally, since the claims depend from claim 6, that the Applicant argues is allowable, claims 7, and 12-14 are also allowable.

Claims 8 – 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Adelson, further in view of Frost and further in view of Kubota *et al*, IEEE Publication, 2000, *Inverse Filters for Reconstruction of Arbitrarily Focused Images from Two Differently Focused Images* (hereinafter, "Kubota")..

Regarding claims 8 – 11, as they depend from claim 6, the Applicant reasserts its argument with respect to Adelson. Without a suggestion or teaching in the references to define image regions corresponding to a location on the object, there can be nothing to teach or suggest an overlapping region using a fuzzy transition as claimed by the Applicant.

The deficiencies in the teachings of Adelson that fail to support a basis of rejection for obviousness are not remedied through the combination of Kubota. Kubota teaches a method of reconstructing images having different focus to generate an arbitrarily focused image – i.e., a synthetic image at any of a desired focus setting having a realistic appearance. While Kubota does teach a solution to the problem of blending regions of images using fuzzy transitions, the teachings of Adelson in view of Kubota do not teach or suggest a step of defining image regions corresponding to a location on the object upon which sharpness scores are measured to determine a spatial weighting, and

used to compute a composite image by combining the image regions using the spatial weighting.

Claims 15 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Adelson, in view of Frost, and in further view of U.S. Patent 5,179,419 to Palmquist *et al* (hereinafter, "Palmquist").

Palmquist discloses a method of inspecting defects in optical fiber end faces, and teaches that an optimal focus position can be empirically derived from a focus function based on a sharpness measurement at the ferrule portion of the fiber. Adelson in view of Frost, and further in view of Palmquist, either alone, or in combination, fail to teach or disclose a step of defining image regions corresponding to a location on the object upon which sharpness scores are measured to determine a spatial weighting, and used to compute a composite image by combining the image regions using the spatial weighting.

Nothing in Palmquist cures the deficiencies of Adelson in view of Frost cited herein before. Because non of the cited reference, alone or in combination, disclose or suggest the Applicant's invention as recited in any of the claims, and because there is nothing to suggest any motivation to combine these references in the manner suggested by the Examiner, the Applicant respectfully submits that claims 15 and 15 are allowable over the cited references.

CONCLUSION

In view of the above remarks, Applicant respectfully requests withdrawal of all rejections and allowance of the claims pending in the application. The Examiner is invited to telephone the undersigned Applicant's Attorney to facilitate advancement of the present Application.

Respectfully submitted,

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